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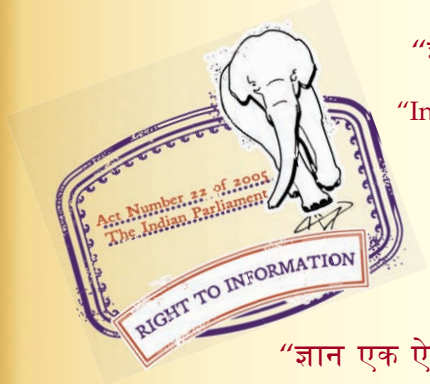

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IS : 5176 - 1985

(Reaffirmed 2001)

Indian Standard

SPECIFICATION FOR HAWSER-LAID HEMP ROPES

(First Revision)

UDC 677·12·072·68

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 2

May 1986

Indian Standard

SPECIFICATION FOR HAWSER-LAID HEMP ROPES

(First Revision)

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Indian Standard

SPECIFICATION FOR HAWSER-LAID HEMP ROPES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 November 1985, after the draft finalized by the Cordage Sectional Committee had been approved by the Textile Division Council.

0.2 This standard was first published in 1969. The present revision has been taken up in the light of the experience gained since its publication. In this revision, the 'hemp lines' has been deleted, as the same has already been covered by IS : 1920-1973*. The requirements for linear density and breaking load (for Grade 2) of 24 mm dia. rope have been modified, the sampling procedure has also been modified and the requirement for 'pitch' has been introduced. Opportunity has also been availed to amend/update the standard in other respects.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

1. SCOPE

1.1 This standard prescribes the requirements for hawser-laid hemp ropes of diameter 8 to 24 mm.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 3871-1984‡ shall apply.

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*Specification for hemp lines (*first revision*).
†Rules for rounding off numerical values (*revised*).
‡Glossary of terms relating to fibre ropes and cordages (*first revision*).

3. ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTS

3.1 The tests shall normally be carried out under prevailing atmospheric conditions. In all cases of dispute, however, the tests shall be carried out on samples which have been conditioned for 24 hours in a standard atmosphere at 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see* IS : 6359-1971*). Where practicable the tests should be carried out in the standard conditioning atmosphere, otherwise they should be carried out as quickly as possible but not exceeding 15 minutes after removal of the test pieces from the conditioning atmosphere.

4. GRADES

4.1 The ropes shall be designed as Grade 1 or Grade 2 depending upon their breaking load.

5. MANUFACTURE

5.1 Fibre — The rope of Grade 1 shall be manufactured from good quality hemp and Grade 2 from average quality hemp. The fibre shall be clean and free from dust, dry pulp or any other foreign matter. No admixture with tow shall be permitted.

5.2 Yarn — The count of yarn employed for all sizes of rope shall be 4·6 k tex and the yarn shall be well and evenly spun. The number of yarns per strand shall be in accordance with the requirements given in Table 1. Each strand shall contain an equal number of yarns.

5.3 Strand — The strands of the rope shall be well formed, evenly twisted and shall be free from grooves and sunken yarn. The strands shall have S-lay.

5.4 Rope — The three strands shall be twisted together in Z-direction. The rope shall be firm in lay and satisfactory in handle and shall be free from splices, joins and defects.

5.5 Coil — The rope shall be supplied in coils. Each coil shall be continuous throughout and shall not contain splices or joins in the strands or in the ropes.

5.6 Lubrication — Weighting or loading matter shall not be used. For the purpose of dressing the fibre and for the preservation of the rope, an emulsion or a mixture of oil and grease shall be added so that the amount of oil is within 10 to 15 percent of the weight of the rope.

*Method for conditioning of textiles.

6. REQUIREMENTS

6.1 The hawser laid hemp ropes shall conform to the requirements laid down in Table 1.

TABLE 1 REQUIREMENTS OF HAWSER-LAID HEMP ROPES

(*Clauses* 5.2 *and* 6.1)

Sl No.	Diameter	No. of Yarns per Strand	Linear Density	Pitch or Maximum Length of 10 Lays	Breaking Load, *Min*	
					Grade 1	Grade 2
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	mm		k tex (g/m)	m	daN	daN
i)	8	3	55	0·26	275	245
ii)	10	4	70	0·33	350	315
iii)	12	6	105	0·40	550	495
iv)	14	8	140	0·46	800	715
v)	16	11	190	0·53	1 195	1 080
vi)	20	17	290	0·66	1 745	1 570
vii)	24	24	415	0·79	2 490	2 240
Tolerance	—	—	± 5 percent	—	—	—
Method of Test	IS : 7071 (Part 3)-1974*		IS : 7071 (Part 2)-1974†	IS : 7071 (Part 3)-1974*	Appendix A	

NOTE 1 — Decanewton (daN) = 1·02 kgf approximately.

*Methods of physical test for ropes and cordages : Part 3 Diameter, circumference and lay.

†Methods of physical test for ropes and cordages : Part 2 Mass, length and linear density.

6.2 Length of Coil — The length of rope in a coil shall be 220 m unless otherwise specified by the buyer. The length of rope in a coil shall be determined by the method prescribed in IS : 7071 (Part 2)-1974*.

7. PACKING

7.1 Unless otherwise agreed to between the buyer and the seller, the hemp ropes shall be packed in accordance with IS : 3256-1980†.

*Methods of physical test for ropes and cordarges : Part 2 Mass, length and linear density.

†Code for inland packaging of ropes and cordages (*first revision*).

8. MARKING

8.1 Each coil shall have a label securely attached on which the following information shall be legibly and indelibly marked:

a) Manufacturer's name or trade-mark,

b) Diameter or rope in mm,

c) Length of rope in the coil in m,

d) Gross and net mass, and

e) Year of manufacture.

8.1.1 Any other marking as agreed to between the buyer and the seller may be given.

8.1.2 The coil may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. SAMPLING

9.1 Lot — The number of coils of rope of the same nominal diameter manufactured under similar conditions and delivered to a buyer against a despatch note shall constitute a lot.

9.2 Sample Size — Sampling shall be as representative as possible of the lot subjected to the measurements and tests. Draw the samples at random, at the rate shown by the following formula:

$$S = 0{\cdot}4\sqrt{N}$$

where S is the number of lengths of rope and N is the size of the lot expressed as a number of 220 m coils. When S as calculated is not a whole number, round off the value obtained to give a whole number in accordance with the requirements of IS : 2-1960*. In cases where S is less than 1, draw one sample length.

*Rules for rounding off numerical values (*revised*).

9.3 Criteria for Conformity — The lot shall be declared conforming to this standard if the conditions given below are satisfied:

a) The length of each coil is not less than the specified length, and

b) The test results of each coil of rope in respect of other requirements as given in Table 1 conform to the requirements specified in the standard.

APPENDIX A

(*Table* 1)

A-1. BREAKING LOAD

A-1.1 Apparatus — Rope tensile testing machine of appropriate capacity with constant-rate-of traverse of the straining head of not less than 150 mm/minute or greater than 305 mm/minute.

A-1.2 Procedure

A-1.2.1 *With Ordinary Grips* — Mount each specimen with an initial length of not less than one metre between the grips of the testing machine. Apply gradually and continuously increasing load until the specimen breaks. If the fracture occurs at or near the grips at less than the specified breaking load, disregard the test and take a further test. Accept the test results corresponding to any specimen that fractures through causes attributable to grip damage as meeting the requirements of the specification provided that the load recorded is not less than 95 percent of the minimum specified breaking load.

A-1.2.2 *With Bollard Grips* — Small size ropes may be tested on testing machine with bollard grips. In such cases, mount the test specimen with an initial length of not less than 250 mm between the bollards of the testing machine ensuring that rate of traverse of the straining head for constant-rate of-traverse machine is as near as possible numerically equal in mm per minute to the length of the specimen. Apply gradually and continuously increasing load until the specimen breaks. If fracture occurs at or near the grips at less than the specified breaking load, disregard the test and take a further test. Accept the test results corresponding to any specimen that fractures through causes attributable to grip damage as meeting the requirements of this specification provided that the load recorded is not less than 95 percent of the minimum specified breaking load.

A-1.2.3 *Ram Horn Grips* — Mount each specimen with an initial length of not less than one metre between two ram horn grips fixed at both the moving and stationary ends of the constant-rate-of traverse testing

machine, taking care that the rope does not slip from the grips during testing. Apply gradually and continuously increasing load until the specimen breaks. Record the load indicated by the machine. If fracture occurs at or near the grips at less than the specified breaking load, disregard the test and take a further test.

A-1.2.4 *Eye-Spliced Rope Test* — Ropes with the ends eye-spliced may be used for the purpose of testing the tensile strength of the rope. The diameter of testing bollards should not be less than 100 mm when testing ropes up to and including 40 mm nominal diameter and not less than 150 mm diameter for ropes larger than 40 mm/diameter. In order to obtain a true value of rope strength, it is desirable that there be as great a length of rope as possible between the splices. When tested eye-spliced, the rope shall be deemed to conform to the requirements of this specification provided the breaking load obtained from the specimen is not less than 90 percent of the breaking load given in Table 1 and provided that the fracture occurs at the splice.

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